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DRAFT - PENDING SIGNATURES

DPI 620 CE

Advanced Modular Calibrator

- WiFi with Windows® CE

- HART® DD

Communications supplement

K0446

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GE
Sensing & Inspection Technologies

Druck DPI 620 CE

advanced modular calibrator

Communications supplement K0446

- WiFi with Windows® CE

- HART® DD

1 Overview

DPI 620 CE

WiFi Option

The WiFi option can only be used with the Druck DPI 620 CE calibrator. This has all the functions of the standard DPI 620 calibrator plus the Windows® CE operating system (version 5.0) and WiFi support. The software with the operating system lets you see and use drawings and documents related to your work.

The DPI 620 CE uses wireless communications (IEEE 802.11g standard) to get access to wireless local area networks (WLAN); to work with data on the internet or corporate networks and files. The WiFi card can be purchased from GE as an option (part number IO620-WIFI).

The first part of this supplement gives examples and procedures for using the Windows® based applications and the wireless function.

For all the standard calibrator functions, instrument preparation and operation, refer to the user manual on the CD (UD-0002): Druck DPI 620 Advanced modular calibrator (K0449).

HART® DD Option

The HART® DD option can be used with either Druck DPI 620 CE calibrator or Druck DPI 620. This feature enables seamless connection to all HART devices without the need to contact the manufacturer for specific drivers.

The second part of this supplement gives examples and procedures for using the HART® function.

2 DPI 620 CE (WiFi)

The CE models include all the equipment that comes with a standard DPI 620 calibrator plus a plastic stylus (to tap small icons on the screen).

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Microsoft Windows CE product screen shots reprinted with permission from Microsoft Corporation.

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3 Windows based applications

The calibrator includes these Windows® based applications:

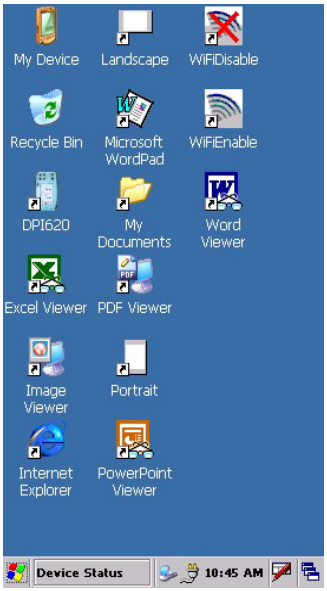
- standard Windows® file management functions
- viewers for pdf files and images (jpg, bmp, png)
- viewers for Word documents, PowerPoint slides and Excel spreadsheets (Microsoft Office 97 or later)
- WordPad text editor
- Internet browser: Internet Explorer

The Windows® based applications include Help text (?). To use the Help information, open the application (double-tap), then tap on "?" **OR** open the Start menu and tap on Help.

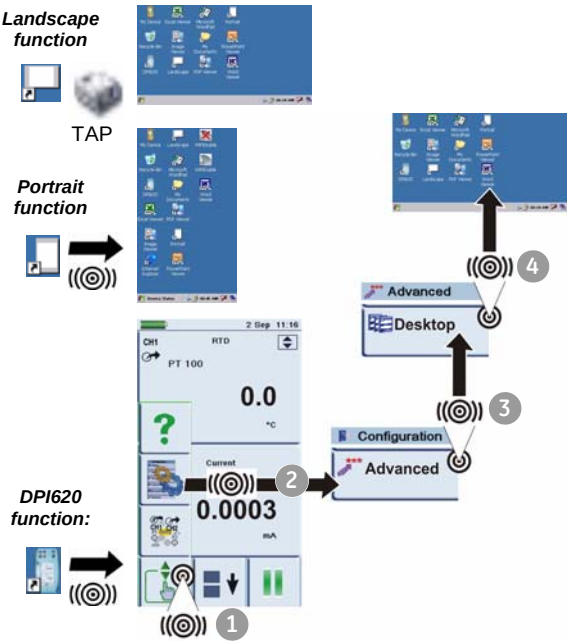
Note: *The default location for all files is My Documents on the internal memory device (Intel). To save files and folders when the calibrator is off, save them only to Intel or to an external memory device; see Section 6.*

4 Special functions (Windows® CE)

Landscape/Portrait: At the end of the power on sequence, the Windows display is in portrait orientation. For most operations in Windows CE, change the display to landscape orientation for the best view of files and documents.



To open the Start menu, tap here



DPI620: This starts the calibrator application; see user manual K0449. To go back to Windows CE, use steps 1 to 4.

5 Recommended operations (Windows® CE)

Copy your calibrator settings: All the default settings for your calibrator are saved in the Windows CE operating system.

Go to: *My Device* > *Intel* > *AMC*

Caution: DO NOT delete or rename this folder (AMC). The calibrator will not work.

We recommend that you copy this folder to an external memory device at regular intervals (USB flash memory or micro SD card; see user manual K0449).

If it becomes necessary, copy your saved version back to the original location (*My Device* > *Intel*).

Set the Backlight: Set this in the calibrator application; see user manual K0449. To make sure the backlight stays on when

you use the applications in Windows CE, set the *Timeout* for your DPI 620 calibrator to 00:00:00.

Set the Auto Powerdown: Set this in the calibrator application; see user manual K0449. This setting has no effect when you work with the applications in Windows CE.

Set the Date and Time: Set these in the calibrator application only; see user manual K0449. Date and time settings in Windows CE are not saved.

6 Memory devices

If you double tap on *My Device*, you can see all your available memory devices:

- *Intel:* This is your internal memory device; available memory ≈ 12 MB. All the files and folders on this device are saved when you remove power. No other internal memory locations are saved. For large files, use external memory.
- *Hard Disk _*: (Optional external memory) This is a USB flash memory device you have attached to the calibrator. You can save files and folders to this device. Hard Disk, Hard Disk 2 ... , shows the device has more than one partition or the device is part of a USB hub.
- *SD Card*: (Optional external memory) This is a micro SD card you have installed in the battery compartment. You can save files and folders to this device.

You can connect a computer to your calibrator with a USB mini Type B cable; see user manual K0449. It can only see external memory devices and it can only see the memory device with the highest priority. SD cards have the highest priority.

7 Wireless functions

To let you quickly connect to a wireless network that is within range, you will need to install a microSD WiFi card. This card can be purchased from GE (part number IO620-WIFI). The card can be installed by removing the battery cover and inserting the card into the slot marked WIFI.

8 OS Upgrade

To use the wireless function, the operating system should be DK373 version 1.01.07 minimum. This can be checked by entering the Configuration menu, selecting Status and then Software Build. To upgrade your operating system go to www.gesensing.com.

9 Recommended operations (WiFi)

Set up the wireless adapter: Double tap the WiFiEnable icon on the Windows® CE desktop. With the default settings, the adapter (WLAN11G1) uses the DHCP function to get all its settings from the wireless network. To change the settings:

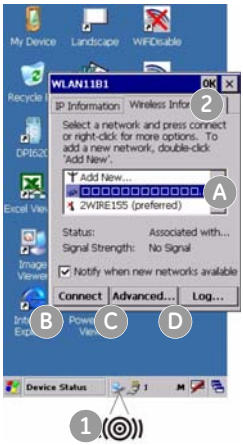
1. Go to: *Start menu* > *Settings* > *Control Panel* > *Network and Dial-up Connections* >
2. Open the *Settings* window for the adapter (double-tap).
3. Change the settings. Use the *Keypad Input Panel* (**A**) to set applicable values for the *IP Address* and *Name Servers* (contact the network administrator).

Start or stop the wireless adapter: Tap the adapter icon (WLAN11G1) and use the *Enable/Disable* button (**B**). When the adapter icon has a red cross, there is no communication. To save power, set the wireless connection to *Disable*.

Set up the Internet Options: The *Internet Options* > *Connection* is set to: *Use LAN* (...). To use the other settings:

1. Open *Internet Explorer* (double-tap).
2. Go to: *View* > *Internet Options* > *Connection*
3. Set the applicable *Network* options. Use the *Keypad Input Panel* (**A**) to set applicable values (contact the network administrator).

10 Wireless operations



Standard operation: When the wireless adapter is set to *Enable* (Section 9), it tries to connect one of your *Preferred* networks. You can also set an *Advanced* option (button **C**) to connect "non-preferred networks" but this has more security risks.

Note: *Each time you connect a new network, it automatically becomes a "Preferred" network.*

If it connects correctly, the *Network Connections* icon (**Step 1**) goes blue. If there is no connection (*No Signal*, wrong *Authentication* data), this icon has a red cross.

If you get a connection, you can use the network. If the network includes access to the internet, open *Internet Explorer* to use it.

Note: *If the DHCP function gets the wrong IP address and DNS data from the wireless network, the browser gives an error message. If necessary, set the values manually (Section 9).*

Caution: To help prevent computer related crimes, use only approved networks with applicable security settings. Contact your network administrator.

See your network list: This list of networks includes all your *Preferred* networks and all networks within range that broadcast their name (SSID).

1. Double-tap the *Network Connections* icon.

2. In the *Network Connections* window for WLAN11G1, select *Wireless Information*.

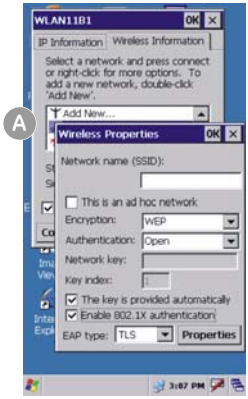
*Panel **A**:* Use this panel to add a new network, choose an alternative or see the network properties (double-tap). If a *Preferred* network is not found, the network icon includes a red cross.

Status: *Connected to* ... ; *Associated with* ... ; *Not Connected*. This gives your connection status. To see the related network name and type, tap *Log ...* (button **D**).

Signal Strength: *No Signal*; *Low*; *Good*; *Very Good*; *Excellent*. This gives the signal strength for the network specified in Status (above).

Connect an available network: To connect another network in the list (Panel **A**), tap it and then tap *Connect* (button **B**). It is possible to see a broadcast SSID but get *No Signal* when you connect it. There is no right-click function.

Your Preferred Networks list: All new connections become *Preferred* networks. To change your *Preferred* networks or change how the list works, tap *Advanced ...* (button **C**).



Add a new network/set properties: You can add a new network or open the *Wireless Properties* window from the network list; see Panel A (above).

When a local network broadcasts its SSID, most of the properties are set automatically. Some networks require security data; contact the network administrator.

If the SSID is not broadcast (private or company networks), you can only complete the wireless connection if you set all the properties yourself; contact the network administrator for the necessary data.

***Note:** For the best security options, contact the network administrator.*

Network name (SSID) To use a network, you must have the correct SSID. It is case sensitive (an SSID is not unique).

This is an ad hoc network In an *ad hoc* network, each device in the network communicates directly with the next (computer-to-computer). All the devices must have the same *Wireless Properties*.

If a device is not *ad hoc*, it must use special *Access Point* hardware. The *Access Point* hardware controls the connections to a local area network or to the internet.

Encryption Sets the method you use to encrypt the data you send and receive.

Disabled (All security options are off)

WEP: Wired Equivalent Privacy (if *Authentication* is *Open* or *Shared*) gives basic security

TKIP: Temporal Key Integrity Protocol (if *Authentication* is *WPA* or *WPA-PSK*) gives better security

Authentication Sets the method of authentication: *Open*; *Shared (Open* is more secure than *Shared)*; *WPA*; *WPA-PSK*

Network key This is the pass key to use the network.

Key index A wireless network can have up to four different pass keys. The pass key and the key index must be correct.

The key is provided automatically This is set if the wireless network sends out the pass key and the key index automatically.

Enable 802.1X authentication This is set if the wireless network and the device use the Extensible Authentication Protocol (EAP) specified in IEEE 802.1X; EAP uses digital certificates.

EAP type These options are available:

TLS (Transport Layer Security). The device and the wireless network can supply a digital certificate.

PEAP (Protected EAP). *PEAP* is more secure than *TLS*. Only the wireless network supplies a digital certificate (a Public-Key Infrastructure (PKI) type certificate).

You can use the *Properties* button to set the applicable certificate options.

Note: *To set a device certificate for the TLS option, the certificate must be in "My Certificates"; go to:*

Start menu > Settings > Control Panel > Certificates >

11 HART® DD

Introduction. You can use the DPI 620 calibrator to communicate with devices that use the HART® protocol:

- The Universal and Common Practice commands specified in HART® revision 5 to 7.
- All devices that support DD (device descriptors).

This section includes procedures to use the HART® functions available in the calibrator.

Before starting:

- Read and understand the “Safety” section, K0449 User Manual.
- Do not use a damaged instrument.

Note: *Use only original parts supplied by the manufacturer.*

About HART®

The HART® (Highway Addressable Remote Transducer) protocol uses a digital signal on top of a standard 4 - 20 mA current loop to get data to and from a HART® enabled field device. The following are typical operations:

- read the primary variable and the analogue output
- read the device serial number, type and supplier
- get calibration data (upper and lower range values, sensor limits, calibration date)
- perform calibrations (sensor trim, analogue trim)
- perform loop tests and device tests
- do status and fault finding checks
- change the device configuration (range, units, damping)

One HART® device (a master device) starts and controls the communications with commands. The field device (a slave device) uses each command to make a change and/or send data back.

Two master devices are permitted: a primary master (usually the main control and monitor system), and a secondary master (usually a hand-held communicator). The DPI 620 calibrator operates as a secondary master.

12 Check list

To use the HART® DD functions the following options must be installed:

- 2 GB microSD card.
- Software application version DK357 version 4 (minimum).

Check the website for details at *www.gesensinginspection.com.*

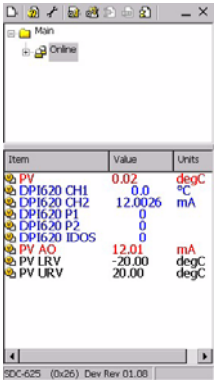
13 First steps

- Set-up the HART® device, if loop power required, use CH2 for current (24V), see section 14.
- If the loop is already powered and there is an external HART resistor turn off channel 2. Connect the channel 2 mA+ and mA- connections across the external HART resistor. See section 14.3.
- If required, turn on the internal HART® resistor. This can be selected by pressing *icon.*
- Press the HART® button.
- The HART® application starts-up.

Getting Device Identity

- The HART® applications operates and displays status information on the bottom left hand side of the screen as the program executes.
- As the HART® application operates the DPI 620 finds the DD associated with the device and all the parameters of the HART® transmitter are collected and loaded into memory.
- If you cannot connect to the device a message box will appear “Cannot find a device”. Refer to section 15.

First screen



- This is the first screen displayed by the instrument showing concise information like Windows® menu tree structure.
- Online = summary view displaying the parameters and variables of interest.

  Items in red - read only

  Items in blue - DPI 620 channel data

  Items in black - can be edited.

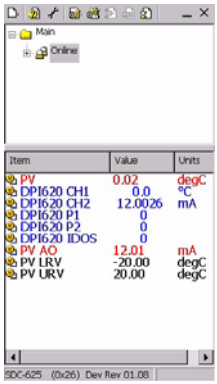
Variables

Launches a data entry screen

Methods

Only a single tap on the screen is required to open any item in black or open any folder.

Terminology



PV = Digital Value of Primary Variable (i.e. this is the parameter that the transmitter measures - pressure, current, voltage).

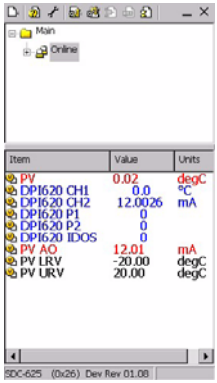
PV AO = Digital Value of Primary Variable mA current.

DPI 620 CH1 = Analogue Value of Primary Variable (actual calibrated value).

DPI 620 CH2 = Analogue value of Primary Variable mA current (actual calibrated value).

DPI620 P1, P2 and IDOS reflect the analogue pressure values measured by the relevant pressure ports on the DPI620.

Range Values



PV LRV = Lower range value of Primary Variable.

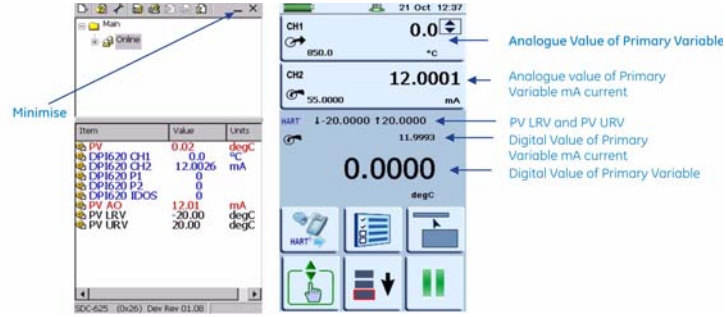
PV URV = Upper range value of Primary Variable.

Example: Transmitter under test has a range of -200°C to +800°C.

Setting the LRV to -20°C (zero value) and URV to +20°C (span value) allows re-ranging the transmitter (zero & span) to specified limits.

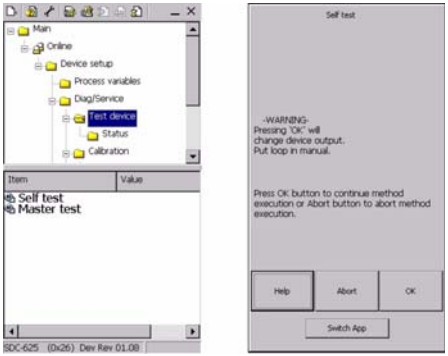
The PV % of range in this example for a PV = 0°C is equal to 50%.

Minimise button.



- Switch between screens by selecting minimise button.
- This shows allows you to switch between Windows to review and adjust the PV during calibrations.

Method



- Any Item that has got a method icon executes a method window to prompt you with on-screen instructions to perform a test or calibration.

Menu Bar

- device connection - pressing this allows the user to connect to a transmitter.

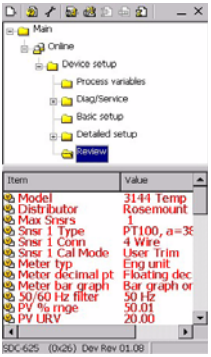
- software version - pressing this allows the user to identify the DK0397 software version.

- preferences - pressing this allows the user to change the search by poll address short tag or long tag.

- commit - pressing this allows the user to commit (write data) to the transmitter anything highlighted in yellow will change.

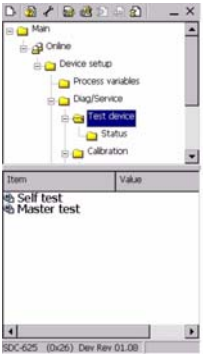
- undo - pressing this allows the user to undo any changes that are highlighted in yellow that were made to the local variables in SDC625.

Review menus

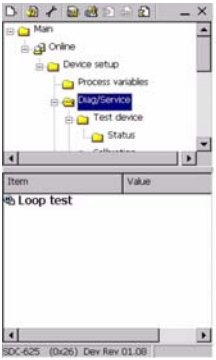


This is the ideal starting point for finding out information on the configuration of your HART® transmitter. It provides details of the model, distributor, tag, serial number, sensor & trim limits, alarm parameters, saturation limits, damping and span limits etc.

Self-test



- To confirm that your transmitter is functioning correctly navigate through the menus to the Self test method button:
- Press the self-test button.
- Press OK and the self-test executes.

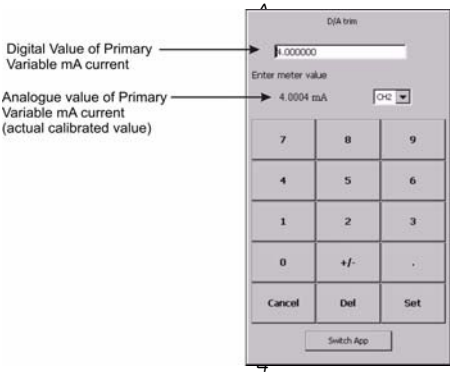


- To confirm that your transmitter is functioning correctly navigate through the menus to the loop test button:
- Press the loop test button.
- Press OK and the loop test executes.
- The loop test can be put into various modes, typically 4 mA and 20 mA should be selected. Selecting the CH2 drop-down box will let you see the Analogue value of Primary Variable mA current (actual calibrated value) of the transmitter. If this value needs adjusting then this can be done using the analogue trim (sometimes referred to as D/A trim) in the calibration menu.

Analog trim (D/A trim)

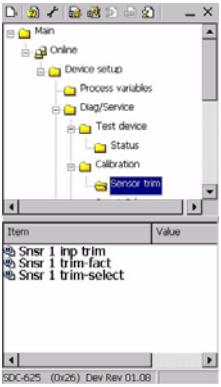
- Using the DPI 620 you can perform an analogue trim on the 4 to 20 mA loop without having to connect any external reference meters.
- Navigate to the calibration folder and select the D/A trim method. Follow the on-screen instructions.

mA

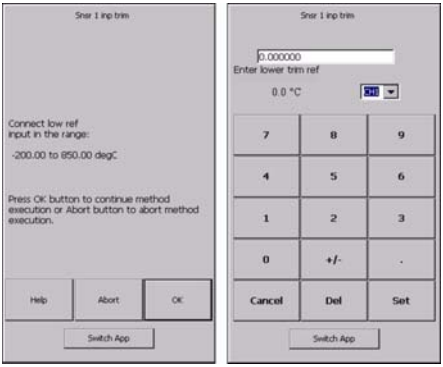


- Type the Analogue value of Primary Variable mA current (actual calibrated value) into the box using the key-pad and then press Set. Repeat this process with 20 mA selected. This will accurately calibrate the transmitter's output 4 to 20 mA loop current.

Sensor Trim

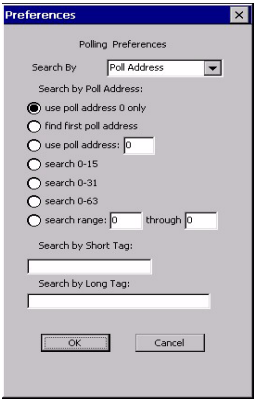


- Using the DPI 620 you can perform a sensor trim on most Primary Variables without having to connect any external reference meters. If the Primary Variable is a pressure device you can use the DPI 620 and PV 62x pressure generation stations to provide the pressure source. Alternatively, you can use DPI 620 and MC 620 to accurately measure pressure.
- Navigate to the calibration folder and select the sensor trim method. Follow the on-screen instructions.



- In this example a lower trim has been selected. The DPI 620 is set-up to source a Primary Variable to the transmitter. CH1 has been configured to output 0°C. This can be done by selecting the Switch App button at the bottom of the method window and configuring the DPI 620 to simulate an RTD at 0°C. By selecting CH1 on the drop-down menu you can view the Analogue Value of the Primary Variable.
- Type the Analogue Value of the Primary Variable (actual calibrated value) into the box using the key-pad and then press Set. Repeat this process with an upper trim value. This will accurately calibrate the transmitter's sensor output.

Preferences



- Selecting the icon allows you to change the poll address, short tag or long tag of the transmitter. The DPI 620 is set by default to use Poll Address 0 (zero) only. This can be changed by selecting the appropriate search radio button or by entering the tag name in the search field.

14 HART® Connections

Examine the power supply connections for the transmitter before connecting the HART® transmitter to the DPI 620 calibrator.

14.1 Power supply from the calibrator

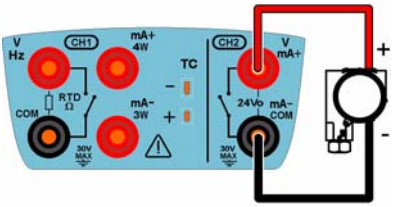
In this example, the DPI 620 calibrator supplies the loop power and a 250Ω HART® resistor.

Measure current on channel 2 (CH2) with 24V loop power

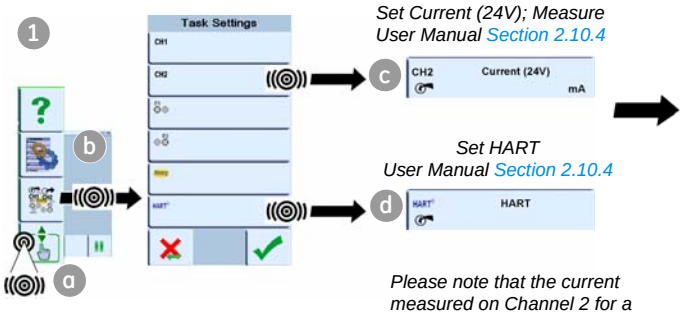
Range: ±55 mA

HART® Function is set

250Ω resistor is set



1. Set the functions for channel 2 and HART®:



Please note that the current measured on Channel 2 for a HART device should normally be between 4 and 20 mA.

2. Set-up the HART® device, if loop power required, use CH2 for current (24V).

   If the loop is already powered and there is an external HART® resistor, turn off CH2. Connect CH2 mA+ and mA- connections to the HART® resistor, see Section 14.4.

   If required, turn on the internal HART® resistor. This can be selected by pressing icon.

   Press the HART® button and the application starts.

3. Complete the electrical connections and continue with the HART® menu operation; see Section 15.

14.2 External loop power

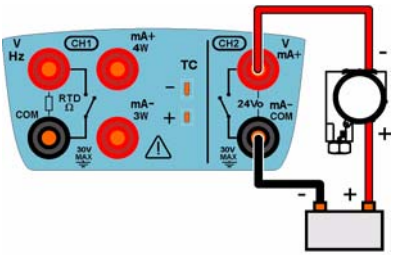
In this example, there is an external power supply.

Measure current on channel 2 (CH2)

Range: ±55 mA

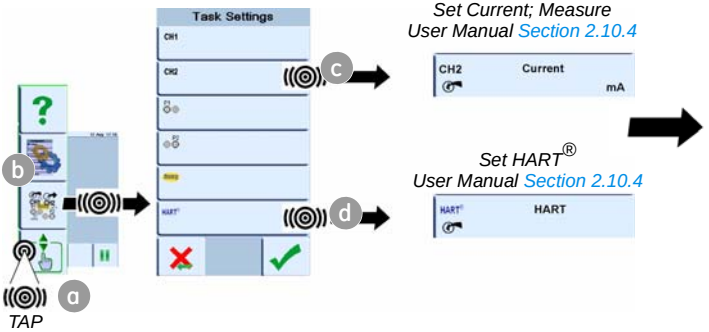
HART® Function is set

250Ω resistor is set



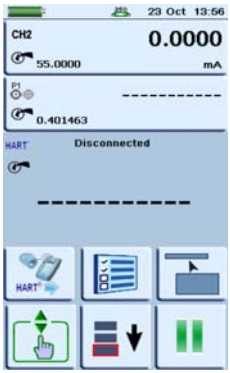
Maximum: 30V

1. Set the functions for channel 2 and HART®:



Home display

2.Set the *HART® Resistor.*



Turn on the internal HART® resistor. This can be selected by pressing icon.

3. Complete the electrical connections and continue with the HART® menu operation.

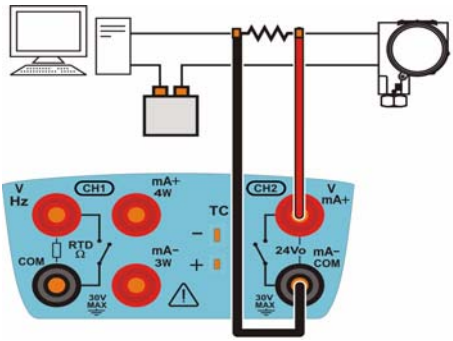
14.3 Communicator attached to a network

In this example, the calibrator connects directly to a network. There must be a 250Ω resistor in series with the loop power supply and the HART® device.

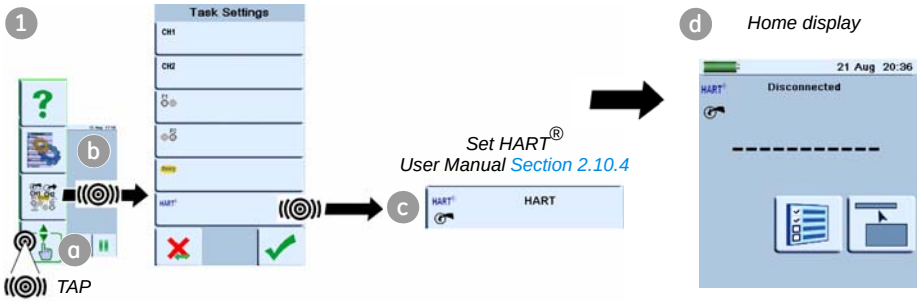
No functions on channel 2 (CH2)

HART® Function is set

250Ω resistor is set to *Off*



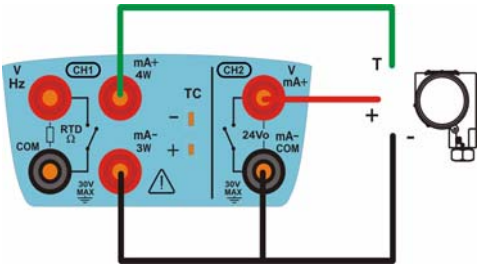
1. Set the function for HART®:



14.4 Use of the test connection

No functions
on channel 2 (CH2)

HART® Function is set



To use the test connection with a HART® transmitter, you must use channel 1 to measure current and channel 2 to communicate with the HART® device. In this mode channel 2 must be turned off, and channel 1 must be placed into current measure mode. There must also be an external HART® resistor in the loop.

15 Failed to find a device

The following is a checklist of what to do if you cannot find a device.

If you are using the DPI620 to supply power, make sure that the internal HART® resistor is turned on.

Check the preferences option and set this to find first, then re-start the application. This will ensure that SDC625 finds a device that is not at poll address 0.

If you are supplying power to the transmitter, check that the loop current measured on channel 2 is between 4 and 20 mA. In alarm conditions it is possible for it to be parked at 21.5 mA or 3.9 mA. However if the current measured by channel 2 is far from these values, there must be a configuration fault.

If the transmitter is powered externally with an external HART® resistor, ensure that channel 2 has been turned off.

16 Customer service

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